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✓ FEDERAL-STATE COOPERATIVE
✓ SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

✓✓ **Montana and Yellowstone River
Tributaries in Wyoming**

By

✓ Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Montana Agricultural Experiment Station

In cooperation with the U. S. Forest Service, U. S. Geological Survey, National Park Service, U. S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and local organizations.

As of

APR. 1, 1950

FEDERAL-STATE COOPERATIVE
SNOW SURVEY AND IRRIGATION WATER FORECASTS

FOR

MONTANA and NORTHERN WYOMING

Upper Missouri and Upper Columbia River
Basins

Report Prepared
by

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Division of Irrigation
Soil Conservation Service

and

Montana Agricultural Experimental Station
Bozemen, Montana

APRIL 1 1950
OUTLOOK FOR
IRRIGATION WATER SUPPLY
FROM SNOW SURVEYS

* * * * *

* On the Upper Missouri basin, the supply is "FAIR" to "GOOD." The *
* Jefferson and Gallatin are slightly below average, with the Madison *
* slightly above average. On the Upper Yellowstone, the supply is *
* close to average pointing to the low side, while the Lower Yellow- *
* stone (Wind, Big Horn, and Shoshone) river basins show an above *
* average condition. The Tongue and Powder River basins measurements *
* indicate a definite trend toward a water shortage this summer in *
* these basins. *
* *
* The Upper Columbia River basin is in excellent condition for an *
* abundant water supply this season. The Flathead and Kootenai have *
* an abnormally large amount of snow with many measurements exceeding *
* all past records for fifteen years. *
* * * * *

The release of this bulletin has been withheld until after the annual meeting of the Upper Missouri River Water Committee held on April 11, 1950 in order to express the general opinion of that group.

JEFFERSON:

The Jefferson River basin has a "FAIR" supply of snow water for this season. Many of the measurements indicate a below average snow water content but not serious enough to become alarming. Most of the snow courses are only three years old and yet stand up well with Elk Horn and Miner Lake where longer records are available.

MADISON:

On the Madison River basin there is an "EXCELLENT" snow pack which indicates a stream flow 30% above the average from snow melt runoff.

GALLATIN:

The Gallatin basin indications are close to average for twelve years of record. With a good spring season, there should be no irrigation water shortage this season other than the usual late deficiency.

MISSOURI MAIN STEM:

The Missouri Main Stem from Three Forks to Fort Benton should flow about average volume judging from records of the past twelve years. The tributary basins to the northwest will, however, be considerably higher in proportion. The Sun, Teton and Marias Rivers show an "EXCELLENT" water supply for this coming runoff season. The Milk and Musselshell rivers have close to average snow water content. May measurements to be made on the upper reaches of the Milk are apt to give a better indication of actual flow by the end of this month.

UPPER YELLOWSTONE:

The Upper Yellowstone River basin is in "FAIR" shape being rather spotted in its above-average figures through Yellowstone Park and the below-average figures along the Absorkee to the northern Big Horn Range. This below average condition is more pronounced on the eastern slopes of the Big Horn Mountains where a definite below average condition exists. Reservoir management on these two rivers should be closely watched to provide water for late irrigation if possible. Crop planning should be revised to meet the situation.



LOWER YELLOWSTONE:

The Wind River and Big Horn River are in "GOOD" to "EXCELLENT" shape where an above average snow pack has been measured on most of the snow courses. The older courses indicate about 30% above average. The Popo Agie River basin above Lander has an exceptionally large supply of water for irrigation this season.

UPPER COLUMBIA RIVER BASIN:

The Upper Columbia River basin snow survey measurements indicate an "EXCELLENT" snow water supply for this coming season. The northern tributaries, Kootenai and Flathead have many snow courses where alltime high water content measurements exist. Accumulated precipitation records parallel these figures. Snow measurements on the Clarks Fork are also above average, the runoff, however, will not be in such large proportions as the Flathead and Kootenai. Snow measurements on the Kootenai basin in Canada indicate an above average seasonal runoff from that portion of the basin.

Once again for the third consecutive year a FLOOD POTENTIAL exists on the Upper Columbia River basin. Abnormally high temperatures accompanied by rain storms will certainly bear watching by all residents having installations in and close to the river channels.

PRELIMINARY ESTIMATES OF RUNOFF AT A NUMBER OF
REPRESENTATIVE GAGING STATIONS IN MONTANA
Soil Conservation Service - Division of Irrigation

<u>NAME OF STREAM</u>	<u>PERIOD AND VOLUME FORECAST IN ACRE FEET</u>		
	<u>May - June</u>	<u>July-August-Sept.</u>	<u>May - Sept.</u>
MISSOURI BASIN:			
Gallatin River at Gateway	242,000	123,000	365,000
Hyalite Creek at Ranger Station	19,800	11,000	35,000
North Fork Musselshell at Delpine	3,570	1,780	5,350
Yellowstone River at Corwin Springs	1,039,000	831,000	1,870,000
Clarks Fork River at Chance	49,200		
Red Lodge River above Cooney Reservoir	14,590	<u>May-June-July</u> 7,930	22,520
Missouri River at Fort Benton	2,375,000		
LOWER YELLOWSTONE:			
Popo Agie River at Riverton	<u>April-June</u>	<u>April-September</u> 550,000	
Wind River at Riverton		750,000	
Shoshone River below Shoshone Dam		1,000,000	
COLUMBIA RIVER BASIN:			
Bitterroot River at Darby	570,000	685,000	1,255,000
Clark Fork above Missoula	1,520,000	1,820,000	3,340,000
Clark Fork below Missoula	2,850,000	3,330,000	6,180,000
Clark Fork at St. Regis	3,750,000	4,370,000	8,120,000
Flathead River at Columbia Falls	7,004,000	8,975,000	15,979,000
Flathead River at Polson	7,309,000	10,075,000	17,584,000
Clark Fork River at Plains	8,580,000	14,900,000	23,480,000
Clark Fork River at Heron	9,800,000	16,900,000	26,700,000

Note: All estimated volumes subject to a discrepancy of plus or minus 10 to 15%.



INDEX TO PLAIN - FOREST WY. IN SNOW COURSES

Location										Location									
Drainage Basin and Course Name	Montana Number	Elev.	Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates ^a	Measured By ^b	Drainage Basin and Course Name	Montana Number	Elev.	Sec. Lat.	Twp.	Range Long.	Record Began	Measuring Dates ^a	Measured By ^b		
JEFFERSON RIVER (ROCK-SEVERHEAD)									MISSOURI RIVER DRAINAGE (Cont.)										
Lakeview Ridge	11E3	7100	27	14S	2W	1918	3,4,5	9	Big Horn River Wyo.										
Lakeview Canyon	11E4	6930	20	14S	2W	1945	3,4,5	9	Beavers Fall	9F8	6900	6	13N	102W	1948	2,3,4,5	Pd.Obs.		
Linekila	11E2	6950	15	5S	9W	1945	3,4	1	Owl Creek	8F1	8700	30	13N	101W	1948	2,3,4,5	Pd.Obs.		
White Pine Ridge	11E1	6850	16	14S	9W	1945	3,4	1	Penelope R.S.	7E3	8300	30	14N	80W	1935	1,5	1		
(ROCK PRAIRIE)									Timber Creek	9E2	6800	25	14N	103W	1948	4,5	1		
bloody Dick	13D10	7000	12	6S	10W	1948	3,4	1	Ranger Creek	7E1	8600	32	53N	88W	1935	4,5	1		
Gold Stone	13D9	6100	11	6S	10W	1945	3,4	1	Wood River	9F7	8000	28	14N	103W	1939	2,3,4,5	1		
Lenni Pass	13E1	7400	9	10S	15W	1945	3,4	1	(SANDHOLE RIVER) WYO.										
Terrell Creek	13D12	6050	14	9S	15W	1948	3,4	1	East Entrance	10E0	7000	17	52N	109W	1948	1,2,3,4,5	5		
Trail Creek	13E2	7090	15	10S	15W	1948	3,4	1	Sylvan Pass	10E5	7100	12	52N	110W	1936	1,2,3,4,5	5		
Selway Junction	13D11	6800	27	6S	15W	1948	3,4	1	TONGUE RIVER WYO.										
(BIG HOLE)									Big Goose	7E2	7700	4	53N	86W	1935	4,5	1		
Big Hole Pass	13D3	7440	28	3S	18W	1948	3,4	1	POWDER RIVER WYO.										
Big Hole Pass(Below)	13D4	6900	24	3S	18W	1948	3,4	1	Red Fork	7E1	7000	18	13N	85W	1936	4,5	Pd.Obs.		
East Boundary	13D5	6700	22	3S	17W	1948	3,4	1	Sour Dough	6E1	8500	17	14N	84W	1936	4,5	1		
Gibbons Pass	13D2	7100	4	2S	19W	1934	2,3,4,5	1,2											
Jahnke Creek	13D8	7340	25	7S	16W	1948	3,4	1											
Miner Forks	13D6	7300	24	6S	17W	1948	3,4	1											
Miner Lake	13D7	6720	10	6S	16W	1945	3,4,5	1											
(WISE RIVER)									KOOTENAI RIVER										
Anderson Mdw.	13D14	7000	18	3S	12W	1948	3,4	1	Baree Mountain	15B1	6000	1	25N	31W	1937	4,5	1		
Elk Horn	13D15	6150	15	1S	12W	1934	3,4,5	2	Blue Bird Basin	14A1	6800	24	37N	26W	1937	4,5	1		
Wise River	13D13	6300	15	2S	12W	1948	3,4	1	Brush Creek	14A4	5000	13	30N	18W	1941	3,4	1		
(RUEY RIVER)									Red Mountain	15A1	6000	4	36N	29W	1937	3,4,5	1		
Cottonwood	11E2	5900	24	10S	3W	1948	3,4	1	FLATHEAD RIVER										
Cottonwood (Upper)	11E1	8400	30	10S	2W	1948	3,4	1	Big Creek	13B3	6750	6x7	22N	18W	1941	4,5	4		
Flashlight	12D3	6950	22	8S	7W	1945	3,4,5	1	Brush Creek	14A4	5000	13	30N	26W	1937	3,4	1		
Tobacco Root	12D2	6900	13	4S	3W	1948	3,4	1	Cattle Queen	13A1	4700	7	35N	17W	1939	3,4	5		
Vigilante	11D1	6125	28	9S	3W	1948	3,4	1	Desert Mountain	13A2	5600	24	31N	19W	1937	1,2,3,4,5	1		
MADISON RIVER									Elk Mountain	13B4	6750	1	20N	19W	1941	3,4	4		
nebgen	11E5	6550	22	11S	3E	1934	1,2,3,4,5	2	Goat Mountain	12B7	7000	20	22N	10W	1934	3,4	2		
West Yellowstone	11E7	6700	34	13S	5E	1934	1,2,3,4,5	2	Hell Roaring Divide	14A3	5770	35	32N	22W	1942	4,5	1		
Norris Basin	10E2	7500	44°-44'	110°-142'	1935	3,4	5,6	5,6	Kishenehn	14A2	4300	7	37N	21W	1946	4,5	5		
JAILLATIN RIVER									Limestone Pass	13B8	7000	34	17N	15W	1948	3,4	1		
Devil's Slide	10D4	8100	14	5S	6E	1935	3,4,5	2,6	Logan Creek	14A5	4300	34	30N	24W	1937	3,4	1		
Hood Meadow	10D3	6600	22	1S	6E	1934	3,4,5	2,6	Marias Pass	13A5	5250	34	30N	14W	1934	1,2,3,4,5	2		
Mystic Lake	10D2	6600	30	3S	7E	1935	2,3,4	6,7	North Fork Jocko	13B7	6330	3	17N	17W	1941	3,4	4		
New World	10D1	6700	24	3S	6E	1939	2,3,4,5	0,7	Rainy Lake	13B6	4300	11	18N	16W	1947	3,4,5	1		
21-Mile	11E6	7150	1	11S	5E	1934	1,2,3,4,5	2	Snow Lab. # 16	13A9	5200	15	29N	14W	1946	1,2,3,4,5	2		
MISSOURI RIVER MAIN STEM									Spotted Bear Mt.	13B2	7000	23	25N	15W	1948	3,4	1		
Chessman Reservoir	12C5	6200	2	8N	5W	1936	1,2,3,4,5	2	Strawberry Lake	13E10	6500	11	28N	19W	1948	3,4	1		
Crystal Lake	9C1	6100	24	12N	17E	1941	3,4	1	Trinkus Lake	13B1	6500	9	25N	17W	1948	3,4	1		
Grasshopper	10C2	7000	19	9N	8E	1938	3,4	1	Trout Lake	13B11	3600	21	28N	17W	1948	3,4	1		
Kings Hill	10C1	7950	35	13N	7E	1937	3,4,5	2	Upper Holland Lake	13B5	7000	28	20N	16W	1948	3,4	1		
Picnic Grounds	12C0	6500	22	5N	6W	1940	2,3,4	3	UPPER CLARK FORK										
Pipestone Pass	12D1	7200	11	1N	7W	1938	2,3,4,5	1	Chessman Reservoir	12C5	6200	2	8N	5W	1936	1,2,3,4,5	2		
Stemple Pass	12C1	6900	10	13N	7W	1934	3,4,5	2	East Fork Ranger Stn13D1	13D1	5400	16	2N	17W	1937	4	1		
Tennile Creek, Lower	12C2	6250	13	8N	6W	1935	1,2,3,4,5	2	El Dorado Mine	13C9	7800	23	8N	12W	1946	4	11		
Tennile Creek, Middle	12C3	6800	13	8N	6W	1934	1,2,3,4,5	2	Gold Creek Lake	13C8	7200	14	8N	12W	1946	4	11		
Tennile Creek, Upper	12C4	8000	19	8N	5W	1935	1,2,3,4,5	2	Intergaard	13C4	6450	6	5N	13W	1939	2,3,4	3		
(TERRON RIVER)									North Fork Jocko	13B7	6330	3	17N	17W	1941	3,4	4		
Fright Creek	12A1	6000	13	26N	10W	1948	3,4	1	Picnic Grounds	12C6	6500	22	5N	6W	1940	2,3,4	3		
Waldron Creek	12B2	5000	16	25N	9W	1948	3,4	1	Pipestone Pass	12D1	7200	11	1N	7W	1938	2,3,4,5	1		
West Fork	12B1	6000	6	25N	9W	1948	3,4	1	Rainy Lake	13B6	4300	11	18N	16W	1947	3,4,5	1		
(SUN RIVER)									Skalkaho Summit	13C3	7258	30	6N	17W	1937	4	1		
Benon Mark	12B8	5500	9	20N	10W	1948	3,4	1	Slide Rock Mountain	13C2	7100	26	10N	16W	1937	4	1		
Cabin Creek	12B0	5400	33	23N	10W	1949	3,4	1	Southern Cross	13C5	6500	9	5N	13W	1939	2,3,4	3		
5-Bull	12B9	5600	30	20N	10W	1948	3,4	1	Stemple Pass	13C1	6900	16	13N	7W	1934	3,4,5	2		
Gates Park	12B5	5300	31	24N	10W	1949	3,4	1	Storm Lake No. 2	12C7	7780	19	14N	13W	1939	4	1		
Goat Mountain	12B7	7000	20	22N	10W	1934	3,4	2	Stuart Mill	13C6	6500	19	5N	13W	1939	2,3,4	3		
My Lake	13B9	7300	21	23N	12W	1950	3,4	1	Stuart Mountain #1	13C1	7400	6	14N	18W	1936	4	1		
Wrong Creek Ridge	12B3	6800	17	25N	10W	1949	3,4	1	Tennile Creek, Lower	12C2	6250	13	8N	6W	1935	1,2,3,4,5	2		
Wrong Creek																			

SUPPLEMENTAL INDEX LISTS OF SNOW SURVEY COURSES
IN ADJACENT BASINS, USED IN THIS REPORT AND
SHOWN ON THE INDEX MAP

DRAINAGE AND SNOW COURSE	Adj. State No.	Mont. No.	Elev. Feet	Section Lat.	Twp.	Range Long.	Record Began	Measure- ment Dates	Measured By
<hr/>									
JEFFERSON	Idaho								
Kilgore	10	11E12	6200	6	12N	39E	1937	1,2,3,4,5	pd. obs.
Blue Ridge Mine	5	11E11	6700	27	13N	38E	1938	4	pd. obs.
Camp Creek	6	12E3	6800	21	13N	36E	1936	1,2,3,4	1
Moose Creek	8	13D16	6200	22-27	27N	21E	1937	3,4,5	1
Big Springs	3	11E9	6500	34	19N	44E	1936	1,2,3,4,5	10
Island Park	9	11E10	3600	28	13N	43E	1936	1,2,3,4,5	10
Valley View	17	11E8	6500	7	15N	44E	1936	1,2,3,4	10
UPPER YELLOWSTONE	Wyo.								
Lewis Lake Div.	9	10E9	7900	44-13		110-40	1919	1,2,3,4	10
Aster Creek	2	10E8	7700	44-17		110-37	1919	1,2,3,4	10
Tom Thumb Summit		10E7	7900	44-22		110-35	1949	3,4	10
LOWER YELLOWSTONE	Wyo.								
(Wind River)									
Togwotee Pass	12	10F1	9600	29	44N	110W	1936	2,3,4,5	10
Kendall	25	9F12	7900	23	38N	110W	1936	3,4,5	1
Loomis Park	26	10F4	8500	14	37N	111W	1942	3,4,5	1
Yellows Jacket	14	10F5	6775	33	42N	112W	1936	3,4,5	1
Black Rock	2	10F3	8600	4	44N	111W	1936	2, 4	10
Dutch Joe	23	9G6	8700	32	31N	104W	1936	4,5	1
Mulligan Park	24	9G5	8900	17	35N	108W	1936	3,4,5	1
KOOTENAI	Idaho		COLUMBIA						
Smith Creek	13	16A1	4800	29	64N	3W	1937	4,5	1
	Canada								
Fernie	10		3500	49-31		115-01	1939		
Gray Creek	34		5100	39-37		116-41	1948		
Marble Canyon	32		5000	51-12		116-09	1947		
Nelson Creek	19		3050	44-25		117-14	1938		
Sinclair Pass	8A		4500	50-40		115-58	1947		
Sullivan Mine	20A		5100	49-43		116-01	1945		
Upper Elk River	41		4400	50-01		114-56	1947		
Kimberley	20		3800	49-41		115-59	1945		
UPPER CLARK FORK	Idaho								
49 Meadows	1	15B10	5000	6	43N	5E	1937	1,2,3,4,5	1
Lookout	10	15B2	5250	4	47N	6E	1921	1,2,3,4,5	1
Above Roland	2	15B7	4350	35	47N	6E	1926	3	12*
Below Roland	3	15B6	3770	34	47N	6E	1926	3	12*
Sunset	16	15B9	5600	28	49N	5E	1921	3	12*
PEND OREILLE	Idaho								
Mosquito Ridge	9	16A4	5110	5	54N	2E	1937	4,5	1
BITTERROOT	Idaho								
Moose Creek	8	13D16	6200	22-27	27N	21N	1937	3,4,5	1
Kit Carson	3	14D3	4700	4	27N	16E	1937	4	1
Savage Pass	7	14C4	6000	18	36N	15E	1937	4	1
Powell Pasture	6	15C3	3700	27	27N	14E	1937	4	1
Packers Mdw.	5	14C2	5700	15	38N	15E	1937	2,3,4,5	1

*Washington Water Power Company

STORAGE IN RESERVOIRS OF MONTANA

MISSOURI RIVER BASIN

Reservoir Volumes in 10,000's of Acre Feet

RESERVOIR	Location or on Diversion from	Usable Capacity	Contents This Year April 1 1950	Contents Last Year April 1 1949	April 1 10-Year Average 1939-48
Lake Sewall	Missouri	37.8	24.0	32.9	
Hauser Lake	Missouri	52.1	27.7	29.9	45.0
Ft. Peck Res.	Missouri	19,000.0	11,940.0	13,140.0	4,148.0
Ruby Res.	Ruby	38.5			
Harrison Lake	Willow Cr.	17.8			
Hebgen Res.	Madison River	345.0	216.6	268.4	240.8
Madison Res.	Madison River	41.0	35.4	35.2	
Smith River Res.	Smith River	10.7			
Gibson Res.	N.Fk. Sun River	105.0	46.6	70.1	75.6
Willow Creek	N.Fk. Sun-Willow Cr.	32.3	3.8	19.4	12.9
Pishkun Res.	N.Fk. Sun River	32.0	18.8	15.9	17.4
Lower Two Medicine L.	Two Medicine River	14.0	0	0	3.6
Four Horns Res.	Badger Creek	20.0	6.0	9.8	8.5
Birch Creek Res.	Birch Creek	30.0	21.3	29.3	24.0
Lake Francis Res.	Birch Creek	112.0	83.3	103.3	68.0
Ackley Lake	Judith River	5.8		5.2	
Durand Res.	N.Fk. Musselshell	7.0	6.4	3.6	
Dead Man Basin	Musselshell River	52.5		---	
Martinsdale Res.	So.Fk. Musselshell	23.1	11.0	13.6	
Fresno Res.	Milk River	127.2	17.7	74.5	
Nelson Res.	Milk River	66.8	5.7	33.5	@73.9
Glacier Lake	Rock Creek	4.2		5.4	---
Mystic Lake	W.Rosebud Creek	20.8	4.3	5.6	30.9
Cooney Res.	Red Lodge Creek	27.5	14.1	5.4	3.5
Tongue Res.	Tongue River	73.9	10.9		
Sherburne Lake Res.	Swiftcurrent Creek	66.1			17.6
Lake Helena	Missouri River	10.4	1.1	1.6	
<u>YELLOWSTONE RIVER BASIN (Wyoming)</u>					
Buffalo Bill	Shoshone	456.6		172.9	267.7
Sunshine	Greybull	52.0			---
Pilot Butte	Wind River	30.1		13.1	18.2
Bull Lake	Wind River	155.0		40.0	56.8
<u>COLUMBIA RIVER BASIN</u>					
Georgetown Lake	Flint Creek	31.0	18.4	26.4	@23.5
E.Fk. Rock Cr. Res.	E.Fk. Rock Creek	16.0			
Nevada Creek Res.	Nevada Creek	12.6		7.6	
W.Fk. Bitterroot Res.	E.Fk. Bitterroot	31.7	3.5	10.0	
Como Lake	Rock Creek	34.8			
Flathead Lake (Sommers)	Flathead River	1,791.0	614.9	561.7	616.4
Little Bitterroot	Little Bitterroot	37.1	29.0*	36.1*	@10.6*
Dry Fork Res.	Dry Fork Creek	6.7	4.9*	3.8*	@ 2.5*
Mission Valley Reservoirs	Mission Valley (Flathead River)	105.0	31.8**	32.3**	@34.4**

* Comprise two reservoirs on Dry Creek

* Comprise two reservoirs on Little Bitterroot River

**Comprise nine small reservoirs on Mission Valley Project Indian Reclamation Service
@ 5-Year average 1944-48

PRECIPITATION DATA FOR APRIL 1, 1950

STATIONS	1949				1950				Accum. Sum To Date	Dep. From Normal	Dep. From Normal
	Oct.	Nov.	Dec.	Jan.	Feb.	March					
						Precip.	Dep. From Normal				
PRECIPITATION											
WEST OF DIVIDE	0.62	0.53	0.34	0.66	0.29	1.70	1.08	4.14	1.01		
Butte	0.21	0.27	0.31	0.67	0.07	0.80	0.19	2.33	-1.04		
Deerlodge	1.20	2.03	0.71	2.23	0.84	----					
Hamilton	0.98	1.42	0.97	1.94	0.82	1.66	0.71	7.79	0.27		
Kalispell	0.74	0.72	0.65	1.75	0.50	0.58	-0.23	4.94	-0.15		
Missoula	2.89	5.28	6.60	8.71	5.20	4.71	1.66	33.39	13.62		
Trout Creek	2.05	2.95	3.51	4.71	2.25	2.76	0.83	18.23	6.66		
Thompson Falls	1.24	1.89	1.89	2.95	1.42	2.03	1.18	11.80	4.03		
(Average)											
CENTRAL DIVISION	1.61	0.57	1.64	1.48	0.14	----					
Pabb	1.19	0.13	0.18	0.17	0.05	----					
Dillon	1.86	0.23	1.28	0.62	T	2.15	1.53	6.14	2.55		
Fort Benton	.90	0.05	0.53	0.91	0.01	2.14	1.28	4.54	0.22		
Great Falls	1.41	0.03	0.86	0.92	0.24	1.51	1.00	4.97	1.34		
Havre	0.28	0.15	0.37	1.05	0.14	0.82	0.03	2.81	-0.46		
Helena WRO	1.40	0.51	0.53	1.20	0.23	1.52	0.66	5.39	0.88		
Livingston	1.82	0.18	1.78	----	----	----					
Lewistown Arpt.	2.32	0.04	1.41	2.81	0.78	1.63	-0.42	8.99	0.26		
Mystic Lake	3.06	5.13	8.73	9.35	3.55	4.94	1.66	33.47	15.93		
Summit (Marias)	1.89	9.81	1.03	2.32	0.65	1.60	-0.02	6.70	-1.60		
Yellowstone Park Wyo.	1.61	0.71	1.67	2.08	0.64	2.04	0.78	9.13	2.93		
(Average)											
EASTERN DIVISION	2.21	0.02	0.72	0.69	0.31	0.80	-0.04	4.75	0.31		
Billings #2	1.15	0.06	0.39	0.39	0.23	0.43	-0.57	3.65	-1.80		
Circie	0.90	0.05	0.50	1.19	0.56	1.05	0.35	4.25	1.00		
Fraser	1.25	0	0.62	0.90	0.25	0.74	0.20	3.76	0.78		
Malta	1.69	T	0.51	0.19	0.33	0.71	0.29	3.43	0.99		
Mildred	0.50	T	0.35	0.87	0.18	0.53	0.12	2.43	0.03		
Medicine Lake	2.43	0.02	0.20	0.22	----	----					
Miles City	0.67	T	1.04	0.83	0.51	----					
Fort Peck	1.35	0.02	0.54	0.66	0.34	0.71	0.06	3.54	0.22		
(Average)											



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MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE **					Water Content (Inches)			Years of Record
No.	Elev.	Date of Survey 1950	Snow Depth (In.) 1950	Average Data			Years of Record	
				April 1 1950	Past Records 1949 1948	Avg. %Avg.		
JEFFERSON RIVER (Rock-Beaverhead)								
11E3	7400	3/31	46.9	11.6	10.0	10.5	110	3
11E4	6930	3/31	56.8	10.3	12.7	11.4	91	3
11E2	6950	3/23	3.8	0.8	4.1	2.6	31	3
11E1	8850	3/23	24.8	7.2	7.2	7.4	97	3
11E12	6200	3/29	44.0	15.5	11.0	10.9	142	14
12E3	6800	3/28	43.0	13.9	10.7	9.0	154	15
11E11	6700	3/27	68.0	26.1	16.7	15.8	165	13
AVERAGE				12.2	10.3	9.66	126.2	
13D10	7600	3/15	39.2	11.6	15.2	12.3	94	3
13D9	8100	3/15	50.4	15.2	19.0	15.7	96	3
13E1	7400	3/21	32.4	9.5	11.8	10.8	88	3
13D12	6650	3/21	10.2	3.0	6.0	4.2	72	3
13E2	7090	3/21	26.6	7.4	10.4	9.4	79	3
13D11	6500	3/21	26.1	7.5	9.2	7.8	96	3
AVERAGE				9.0	12.0	10.0	90	
13D 3	7440	3/16	3.2	18.2	24.5	19.2	94	3
13D4	5900	3/16	7.2	15.4	19.6	15.8	98	3
13D5	6700	3/16	9.3	8.8	11.8	9.4	94	3
13D8	7340	3/15	57.8	10.8	14.4	11.4	95	3
13D6	7300	3/14	39.0	11.4	13.8	11.9	96	3
13D7	6720	3/14	26.6	7.6	10.6	8.2	93	6
13D16	6200	4/3	54.0	18.4	21.2	15.4	120	14
AVERAGE				15.1	18.1	14.10	98	
13D14	7000	3/17	27.6	8.3	10.6	8.6	96	3
13D15	8450	4/1	34.5	10.0	13.6	9.0	110	12
13D13	6300	3/17	15.6	5.2	7.4	5.8	90	3
AVERAGE				7.8	10.5	7.8	99	
11E2	5900	3/24	35.5	11.5	11.9	10.2	112	3
11E1	3400	3/24	39.0	12.1	11.6	10.7	113	3
12D3	6950	3/22	14.5	4.2	6.7	5.5	76	6
12D2	6900	3/25	35.6	11.4	13.3	11.8	97	3
11D1	6125	3/24	4.2	1.0	0.0	1.1	100	3
AVERAGE				8.1	8.7	7.9	100	

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MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE **					Water Content (Inches)					Years of Record
No.	Elev.	Date of Survey 1950	Snow Depth (In.) 1950	April 1 1950	Past Records		Average Data		%Avg.	Record
					1949	1948	April 1	Avg.		
MADISON RIVER										
Hebgen	6550	3/30	42.2	14.0	14.6	11.7	12.2	115	15	
West Yellowstone	6700	3/31	42.5	14.2	14.4	9.0	11.0	129	14	
21-Mile	7150	3/31	61.3	21.0	20.6	14.4	16.3	129	14	
Big Springs	6500	3/28	74.0	25.9	27.8	18.1	20.4	126	15	
Island Park	3600	3/29	65.0	21.6	22.5	13.8	15.3	141	15	
Valley View	6500	3/29	62.0	19.5	18.8	12.8	14.6	134	15	
		AVERAGE	57.8	19.4	19.8	13.3	14.9	130		
GALLATIN RIVER										
Devil's Slide	8100	4/1	70.6	20.2	20.8	27.4	19.8	102	12	
Hood Meadow	6600	4/1	28.4	7.3	10.9	13.3	8.3	88	12	
Mystic Lake	6600	3/30	28.6	8.4	10.7	8.1	8.5	99	14	
New World	6700	3/30	38.8	10.8	11.4	16.0	9.8	111	12	
21-Mile	7150	3/31	61.3	21.0	20.6	14.4	16.3	129	14	
		AVERAGE	45.5	13.5	14.9	15.8	12.5	108		
MISSOURI RIVER MAIN STEM										
Chesman Reservoir	6200	4/1	15.6	4.4	7.6	9.2	4.6	96	15	
Crystal Lake	6100	4/1	39.4	10.5	15.4	16.3	12.2	86	10	
Grasshopper	7000	3/29	22.4	5.8	8.1	6.8	5.2	111	13	
Kings Hill	7950	4/4	56.3	17.1	16.9	13.1	13.1	130	12	
Pipestone Pass	7200	3/31	20.2	4.2	7.9	7.4	5.6	75	12	
Stemple Pass	6900	3/31	44.2	11.6	13.5	10.3	9.4	123	12	
Tenmile, Lower	6250	4/3	28.8	7.6	8.8	9.1	6.2	142	15	
Tenmile, Middle	6800	4/4	48.9	12.8	12.8	14.1	10.2	133	15	
Tenmile, Upper	8000	4/3	54.3	15.8	14.8	18.1	13.1	121	15	
		AVERAGE	36.7	9.8	11.8	11.6	8.4	113		
(Teton River)										
Fright Creek	6000	3/30	60.2	22.3	17.9	13.4	17.9	125	3	
Waldron Creek	5600	3/29	30.8	10.7	9.5	6.0	8.7	124	3	
West Fork	6000	3/29	63.0	24.6	19.9	13.6	19.4	127	3	
		AVERAGE	51.3	19.2	15.8	11.0	15.3	126		

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AND SNOW COURSE **	No.	Elev.	of Survey 1950	Depth (In.) 1950	April 1 1950	Past Records		Average Data		Years of Record
						1949	1948	April 1 Avg.	%Avg.	
(Sun River)										
Benchmark	12B8	5500	3/28	35.2	12.8	12.0	9.3	11.4	112	3
Cabin Creek	12B6	5400	4/5	28.7	9.5	7.5	0.0	0.0	00	2
5-Bull	12B9	5600	3/28	27.3	9.2	8.8	8.8	8.9	103	3
Gates Park	12B5	5300	4/4	39.9	13.1	11.7	0.0	0.0	00	2
Goat Mountain	12B7	7000	3/31	50.0	15.2	15.4	11.7	10.0	154	12
My Lake	13B9	7300	4/3	142.0	54.1	0.0	0.0	0.0	00	1
Wrong Creek Ridge	12B3	6800	3/30	78.4	28.5	22.5	0.0	0.0	00	2
Wrong Creek	12B4	5700	3/29	57.4	20.2	15.7	0.0	0.0	00	2
(Marias River)			AVERAGE	57.3	20.3	13.4	9.9	10.1	123	
Marias Pass	12B5	5250	3/31	83.0	28.7	21.4	18.9	17.0	169	15
Snow Lab. #16	13A9	5200	3/28	83.5	28.2	22.4	19.2	24.8	106	4
(Milk River)			AVERAGE	83.3	28.5	21.9	19.1	20.9	136.3	
Rocky Boy	9A1	5200	3/31	20.0	5.1	6.7	6.7	5.7	90	9
UPPER YELLOWSTONE										
Camp Senia	901	7890	3/31	26.2	5.8	7.4	9.3	7.2	81	13
Canyon	10E3	7750	3/31	58.5	18.5	18.3	12.7	16.0	116	5
Cooke City	10D7	7400	3/31	32.7	8.4	10.6	10.1	7.5	112	14
Crevice Mt.	10D5	8400	4/	36.6	9.4	13.0	13.8	10.4	90	16
Independence	10D6	8000	3/26	70.4	21.2	20.3	18.6	18.3	116	10
Lake Camp	10E4	7850	3/31	45.5	13.6	15.2	11.5	9.2	148	15
Lupine	10E1	7300	3/30	40.1	11.7	14.2	10.1	9.7	121	12
Lewis Lake Divide	10E9	7000	3/16	127.0	45.4	47.1	31.8	41.9	108	31
Astor Creek	10E8	7700	3/16	106.0	38.8	38.6	22.7	29.8	130	32
Tom Thumb Summit	10E7	7900	3/16	81.0	28.6	27.4	16.9	24.3	118	4
(Shields River)			AVERAGE		20.6	21.2	15.8	17.3	114	
Porcupine	10C3	9200	4/1	22.6	5.7	9.1	6.1	4.6	124	12
(Musselshell River)										
Grasshopper	10C3	7000	3/29	22.4	5.8	8.1	6.8	5.2	111	13

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DRAINAGE BASIN AND SNOW COURSE **	No.	Elev.	Date of Survey 1950	Snow Depth (In.) 1950	Water Content (Inches)				Years of Record	
					April 1 1950	Past Records		Average Data		
						1949	1948	April 1 %Avg.		
LOWER YELLOWSTONE (Wind River)										
Brooks Lake #3	10F2	9200	3/29	93.7	31.8	26.2	21.1	21.0	152	15
Burrroughs Creek	9F6	8800	3/31	58.4	19.8	13.9	0.0	0.0	00	2
Dinwoodie	9F10	10000	3/28	58.2	18.6	0.0	0.0	0.0	00	1
Dry Creek	9F9	9500	3/28	38.9	10.5	0.0	0.0	0.0	00	1
Du Noir	9F2	8750	3/30	42.9	13.4	10.3	7.5	9.7	138	10
Geyser Creek	9F3	8500	3/30	38.4	11.3	10.1	0.0	0.0	00	2
Hobbs Park	9G2	10000	3/27	76.2	27.7	22.8	0.0	0.0	00	2
Little Warm	9F4	9500	3/30	65.2	22.1	17.0	0.0	0.0	00	2
Mosquite Park	9G3	9500	3/27	47.0	14.3	10.4	0.0	0.0	00	2
Sheridan	9F1	7500	3/29	29.7	7.7	8.6	6.0	6.3	122	15
St. Lawrence	9F11	9000	3/26	39.2	10.5	9.6	4.9	8.2	129	7
T-Cross Ranch	9F5	8000	3/31	27.5	7.7	7.3	5.6	6.6	117	10
Trout Creek	9G1	8400	3/27	24.2	7.1	8.2	0.0	0.0	00	2
Togwotee Pass	9F1	9600	3/27	116.0	28.4	32.0	27.4	28.0	137	15
Kendall	9F12	7900	4/1	46.1	13.1	15.0	6.3	11.2	117	14
Loomis Park	10F5	8500	4/1	69.2	26.6	19.6	15.3	16.5	161	15
Black Rock	10F3	8600	3/27	89.0	28.9	23.6	20.3	21.0	138	15
(Popo Agie River)			AVERAGE	56.4	18.2	15.6	12.7	14.2	134	
Blue Ridge	8G2	9500	4/2	54.2	19.1	15.9	10.8	10.9	175	11
Grannier Meadows	8G4	9000	4/2	67.9	24.3	17.5	14.2	12.8	190	14
Larsen Creek	9G4	9000	4/3	70.0	22.8	0.0	0.0	0.0	00	1
Sawmill Glade	8G1	8500	4/2	18.9	6.2	8.0	10.2	6.1	102	11
South Pass	8G3	9000	4/2	66.1	23.7	17.6	11.0	13.4	177	11
Mulligan Park	9G5	8900	4/1	48.9	15.0	11.1	7.0	10.5	143	15
Dutch Joe	9C6	8700	4/1	36.6	11.2	0.0	0.0	0.0	00	1
BIG HORN RIVER (Wyoming)			AVERAGE	51.8	17.4	14.0	10.7	10.1	158.2	
Beavers Mill	9F8	8000	4/6	40.2	8.9	7.9	0.0	0.0	00	2
Owl Creek	8F1	8700	4/5	27.8	6.2	6.6	0.0	0.0	00	2
Tensleep R. S.	7E3	8300	3/31	32.2	8.4	8.5	6.3	6.9	122	14
Timber Creek	9E2	9000	3/31	16.5	4.7	7.5	0.0	0.0	00	2
Ranger Creek	7E1	8800	4/2	44.5	9.3	9.8	8.0	8.2	113	14
Wood River	9E7	8000	3/30	18.2	5.0	7.4	6.1	5.5	91	9
			AVERAGE	29.9	7.1	8.0	6.8	6.9	102.8	

MONTANA SNOW SURVEYS April 1, 1950

MISSOURI BASIN DRAINAGE BASIN					Water Content (Inches)				Years of Record
No.	Elev.	Date of Survey 1950	Snow Depth (In.) 1950	April 1 1950	Past Records		Average Data		
					1949	1948	April 1	%Avg.	
AND SNOW COURSE **									
SHOSHONE RIVER									
East Entrance	10E6	7000	3/31	32.8	11.3	17.7	0.0	0.0	2
Sylvan Pass	10E5	7100	4/1	52.6	18.6	19.4	14.8	13.3	13
TONGUE RIVER									
Burgess Junction	7E4	7900	3/20	43.7	12.0	0.0	0.0	0.0	1
Big Goose	7E2	7700	3/20	12.9	2.5	5.3	5.5	4.2	14
Dome Lake	7E5	8800	3/20	31.8	5.9	0.0	0.0	0.0	1
			AVERAGE	29.5	6.8				
POWDER RIVER									
Muddy Pass	7E7	9700	3/16	31.4	8.4	0.0	0.0	0.0	1
Sour Dough	6F1	8500	4/3	25.3	5.1	7.7	8.0	5.9	14
Soldier Park	7E6	8700	3/17	20.8	4.6	0.0	0.0	0.0	1
			AVERAGE	25.8	6.0				
COLUMBIA RIVER DRAINAGE IN MONTANA									
KOOTENAI									
Raree Mountain	15B1	3000	3/31	151.8	61.3	55.2	40.6	38.8	12
Blue Bird Basin	14A1	5800	3/31	136.8	46.3	37.7	36.8	34.7	12
Brush Creek	14A4	5000	3/29	61.7	18.9	19.0	0.0	12.0	6
Fernie	Canada	3500	3/31	45.9	14.9	7.7	8.4	6.4	12
Ferguson	Canada	2900	3/31	59.1	23.9	21.1	22.1	18.6	11
Gerrard	Canada	6000	3/31	55.3	16.1	12.5	16.7	14.5	14
Gray Creek	Canada	5100	3/30	76.5	24.0	20.5	19.6	21.4	3
Kimberley	Canada	3800	3/31	37.0	11.2	7.1	5.5	4.3	12
Marble Canyon	Canada	5000	3/31	57.0	15.7	13.0	13.3	13.3	4
Nelson Creek	Canada	3050	3/30	49.6	19.9	18.8	15.1	12.0	12
Red Mountain Mont.	15A1	6000	4/4	87.4	30.4	21.3	19.2	18.2	12
Sandon	Canada	3500	3/31	44.7	14.5	12.8	11.4	10.1	11
Sinclair Pass	Canada	4500	3/31	27.8	5.9	3.6	4.1	4.7	12
Smith Creek	16A1	4800	3/31	155.0	58.1	49.3	42.2	40.2	6
Sullivan Mine	Canada	5100	4/1	64.7	21.1	15.3	14.7	16.2	4
Upper Elk River	Canada	4400	3/31	36.2	10.9	7.5	9.1	9.2	3
			AVERAGE	71.3	24.1	20.1	18.5	16.4	

MONTANA SNOW SURVEYS April 1, 1950

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	No.	Elev.	Date of Survey 1950	Snow Depth (In.) 1950	Water Content (Inches)				Years of Record	
					April 1 1950	Past Records		Average Data		
						1949	1948	April 1 %Avg.		
FLATHEAD RIVER										
Big Creek	13B3	6750	3/30	151.0	53.8	0.0	45.8	38.2	141	8
Brush Creek	14A4	5000	3/29	61.7	18.9	19.0	0.0	12.0	158	6
Cattle Queen	13A1	4700	4/2	120.7	45.3	35.5	31.2	29.7	152	12
Desert Mountain	13A2	5600	3/31	71.8	23.3	19.3	14.8	14.6	160	12
Hell Roaring Divide	14A3	5700	3/31	11.3	37.6	34.0	31.0	30.1	125	7
Kishonehn	14A2	4300	3/30	40.3	10.7	8.0	5.5	7.7	139	5
Limestone Pass	13B8	7600	4/1	141.7	54.7	46.3	43.6	48.2	112	3
Logan Creek	14A5	4300	3/30	39.1	10.3	12.5	10.0	7.3	141	12
Marias Pass	13A5	5250	3/31	83.0	28.7	21.4	18.9	17.0	169	15
North Fork Jocko	13B7	6330	4/1	149.0	56.2	0.0	46.2	39.8	142	9
Rainy Lake	13B6	4300	3/30	44.0	18.9	14.5	11.0	13.6	139	4
Snow Lab. #16	13A9	5200	3/28	83.5	28.2	22.4	9.2	24.8	106	4
Spotted Bear Mt.	13B2	7000	3/29	50.8	19.2	19.6	0.0	19.4	99	2
Strawberry Lake	13B10	6500	4/30	166.3	59.1	47.8	43.8	50.2	118	3
Trinkus Lake	13B1	6500	3/29	156.4	57.3	45.0	47.6	50.0	114	3
Trout Lake	13B11	3600	3/30	76.4	27.0	21.0	14.6	20.9	129	3
Upper Holland Lake	13B5	7000	4/5	125.6	50.8	0.0	0.0	0.0	00	1
			AVERAGE	98.4	35.3	24.0	27.4	26.5	133.2	
UPPER CLARK FORK										
Chessman Res.	12C5	6200	4/1	15.6	4.4	7.6	9.2	4.6	96	15
East Fork R. S.	13D1	5400	3/31	23.7	7.6	10.8	3.5	4.8	158	12
El Dorado Mine	13C9	7800	4/4	88.6	27.7	--	--	--	--	2
Gold Creek Lake	13C8	7200	4/4	68.0	20.4	--	--	--	--	1
Intergaard	13C4	6450	4/13	28.9	8.0	10.8	10.4	8.4	100	6
North Fork Jocko	13B7	6350	4/1	149.0	56.3	0.0	46.2	39.8	142	9
Pipestone Pass	12D1	7200	3/31	20.2	4.2	7.9	7.4	5.6	75	12
Rainy Lake	13B6	4200	3/30	44.0	18.9	14.5	11.0	13.6	139	4
Skalkaho Summit	13C3	7258	4/3	96.6	24.0	34.6	29.2	22.8	105	12
Slide Rock	13C2	7100	4/5	62.6	16.0	18.8	19.1	13.6	138	14
Stemple Pass	13C1	6900	7/31	44.2	11.6	13.5	10.3	9.4	107	12
Storm Lake #2	12C7	1207	4/4	56.6	16.7	15.1	19.7	16.6	101	12
Stuart Mill	13C6	6500	4/13	21.6	7.2	9.5	9.2	6.4	113	6
Stuart Mount. #1	13C1	7400	4/2	103.5	37.9	33.3	38.2	28.6	134	13
Picnic Grounds	13C6	6500	4/13	10.0	2.6	--	4.7	3.2	81	5
Southern Cross	13C5	6500	3/13	15.4	4.4	7.3	6.8	4.5	99	6

MONTANA SNOW SURVEYS April 1, 1950

MISSOURI BASIN DRAINAGE BASIN

AND SNOW COURSE **

		No.	Elev.	Date of Survey 1950	Snow Depth (In.) 1950	Water Content (Inches)				Years of Record	
						April 1 1950	Past Records		Average Data		
							1949	1948	Avg.		%Avg.
UPPER CLARK FORK (Continued)											
Tenmile, Lower	12C2	6250	4/3	28.8	7.6	8.8	9.1	6.2	142	15	
Tenmile, Middle	12C3	6800	4/4	48.9	12.8	12.8	14.1	10.2	122	15	
Tenmile, Upper	12C4	8000	4/3	54.3	15.8	14.8	18.1	13.1	121	15	
Lookout	15B2	5250	4/4	121.0	47.5	17.7	17.7	17.7	260	6	
Above Roland	15B7	4350	3/10	98.7	35.0	11.7	11.7	11.7	11.7	1	
Roland			3/10	129.6	45.4	11.7	11.7	11.7	11.7	1	
Below Roland	15B6	3770	3/10	53.8	18.4	11.7	11.7	11.7	11.7	1	
Above Burke		4100	3/6	79.6	26.8	11.7	11.7	11.7	11.7	2	
Sunset	15B9	5600	3/7	117.5	34.0	11.7	11.7	11.7	11.7	1	
					AVERAGE	22.2	18.3	14.0	153		
PEND OREILLE											
Baree Mt.	13B1	6000	3/31	151.8	61.3	52.2	10.6	38.8	158	12	
Freezeout Summit	15C3	7000	4/5	132.7	36.6	37.6	33.7	0.0	109	14	
Hoodoo Creek	13C1	6200	4/5	176.0	70.0	59.5	42.0	45.6	154	14	
Mosquito Ridge	16A4	5600	4/3	177.0	50.6	14.5	31.5	34.3	151	14	
					AVERAGE	54.4	37.1	37.2	143		
BITTERROOT											
Fast Fork R. S.	13D1	5400	3/31	23.7	7.6	10.8	6.5	4.8	158	12	
Gibbons Pass	13D2	7100	3/31	84.4	30.0	29.0	23.0	21.5	139	12	
Mud Creek Pasture	14C1	4500	4/1	23.3	8.2	13.4	8.7	6.4	128	14	
Nezperce Camp	14D2	5580	4/5	46.2	16.0	20.8	14.9	13.0	123	14	
Nezperce Pass	14D1	6575	4/5	59.6	20.0	24.0	23.6	16.9	118	14	
Skalkaho Summit	13C3	7258	4/3	96.6	24.0	34.6	29.2	22.8	105	12	
Stuart Mt. #1	13C1	7400	4/2	103.5	37.9	23.3	38.2	28.6	134	13	
Moose Creek	13D16	6200	4/3	54.0	18.4	21.7	18.7	15.4	120	14	
Kit Carson	14D3	4700	4/6	27.6	9.0	11.7	11.7	64.7	139	12	
Savage Pass	14C4	6000	3/29	106.1	34.4	11.7	11.7	22.8	151	8	
Powell Pasture	15C3	3700	3/30	55.0	20.4	11.7	11.7	12.3	166	11	
Packers Meadow	14C2	5700	4/1	77.7	31.1	20.0	24.3	20.8	150	14	
					AVERAGE	71.2	21.7	18.7	129.4		





Federal - State - Private
COOPERATIVE SNOW SURVEYS

Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"

